Source Water Assessment Program (SWAP) Report For Waterview Associates

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

? Inventory land uses within the recharge areas of all public water supply sources;

? Assess the susceptibility of drinking water sources to contamination from these land uses; and

? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
July 1, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Waterview Associates
PWS Address	27 Jill Marie Drive
City/Town	Carver, Massachusetts
PWS ID Number	4052044
Local Contact	Debra Balboni
Phone Number	508 746-6111

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	4052044-01G	210	684	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Waterview Associates is a privately owned retirement housing development serving 64 year-round homes and a clubhouse. The Association is served by Well #1 that is located in a wooded area in the southeast portion of the development. Well #1 is a 4-inch well drilled to a depth of 53 feet below grade. In 1997 the well pit was eliminated and the well casing was extended above grade level. The area around the well was graded as to slope away from the well preventing any standing water to accumulate around the well. The system is equipped with a propane fueled emergency power generator. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. In a Feb. 9, 1987 letter, the Department approved a 72-hour pump test for the well. The average daily withdrawal for the well is limited to 12,800 gallons per day based on the current

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by **the** water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Zone I of 210 feet and Interim Well Protection Area (IWPA) of 684 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA.

Waterview Associates has been placed on increased monitoring frequency for nitrate due to previous detections of nitrate > 5 milligrams per liter. Although the maximum contaminate level (MCL) has not been exceeded 310 CMR 22. 06 (7) (c. states in relevant part that for all public water systems, their repeat monitoring frequency for groundwater system shall be quarterly for at least one year following any one sample in which the concentration is > 50 percent of MCL. The MCL for nitrate is 10 milligrams per liter.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

2. Discussion of Land Uses in the Protection Areas

Zone I

The Well meets DEP's restrictions that only allow water supply related activities in Zone Is. The public water supplier controls all land encompassed by Zone I.

Recommendations:

- Keep non-water supply activities out of the Zone I.
- Do not use or store pesticides, fertilizers or road salt within the Zone I.

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **STORM WATER RETENTION PONDS,**
2. **LAWN CARE AND LANDSCAPING,**
3. **SEPTIC SYSTEMS,**
4. **AGRICULTURAL.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Agriculture	No	Well #1	High	Pesticide use and fertilizer use
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Well #1	Moderate	Lawn care, gardening, septic systems, household hazardous waste
Septic System	No	Well #1	Moderate	Refer to septic system brochure in the attachments
Storm Water Drains/Retention Basins	No	Well #1	Low	Two (2) retention basins
Structures	No	Well #1	-	Non-water supply structures in IWPA

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please refer to the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Storm Water**–There are two (2) storm water retention areas**.** A retention pond is located approximately 225 feet north of the well (north pond) and a dry retention basin (west basin) is located approximately 300 feet west of the well. The north pond receives storm water from a series of catch basins interconnected via a drain line under Jill Maria Drive, Douglas Drive and Christopher Crossing road within the Association. The west retention basin receives storm water from a series of catch basins, interconnected via a drain line, on Jill Maria Drive and from the clubhouse parking area. The west basin is dry except after the heaviest rainfall events. The north pond is surrounded by a fence and contains a domesticated goose and numerous goldfish. Waterfowl and other wildlife waste in and around the north pond are a potential source of contamination to the water supply. The retention pond also serves as a fire pond for the Association. The north pond appears to been excavated below groundwater elevation and at the time of the site visit contained 6 to 7 feet of water. Maintenance is required for the proper operation of the north pond as a retention basin for storm water.

   Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Storm water pollutants such as nitrogen can be found in animal waste, fertilizers and failing septic systems. Surface water related impacts from nitrogen can manifest themselves through algae growth, reduce water clarity and the release of other pollutants. The north pond was observed to have had significant algae growth and poor water clarity.

   Recommendations:

   - The north pond and western basin should be inspected at least once per year to ensure that they are operating as designed.
   - At least twice during the growing season, side slopes and embankments should be mowed and accumulated trash and debris removed.
   - Sediments should be removed from the pond as necessary and at least once every ten years.
   - Sweeping streets and parking lot reduces the amount of potential contaminants in storm runoff. It is critical to remove accumulated sediments from the winter months before heavy and frequent spring precipitation, especially with catch basins without deep sumps or from basins that have not been maintained.

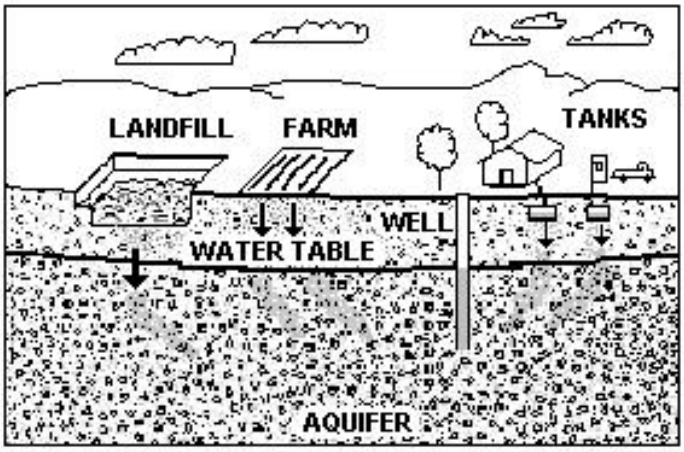

Figure 1: Example of how a well could become contaminated by different land uses and activities.

   - Provide signs and educational materials to residents as to importance of proper disposal of pet waste.
   - Discourage wildlife by prohibiting the feeding of waterfowl and wildlife.
   - Consider structural Best Management Practices (BMPs) to prevent pollution from storm water affecting water quality. Best management practices reduce or prevent pollution from reaching water bodies and control the quantity/quality of runoff from a site (refer to *Storm Water Management Handbook*, volume 1 and 2 for information on structural BMPs located in attachments).
   - Consider testing of surface water in the north pond for concentrations of fecal coliform, nitrate, ammonia, dissolved oxygen, specific conductance and pH.
   - All sediments and hydrocarbons (i.e. Oil/water separators) should be properly handled and disposed in accordance with local, state and federal guidelines regulations. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all Department regulations, policies and guidance.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

2. **Lawn Care and Maintenance**-Over application of pesticides and fertilizers on lawns is a potential source of contamination to the water supply.
   Recommendation:
   - Provide educational materials to residents about the proper application of pesticides or fertilizers. Refer to attachment, A Homeowner Guide to Environmentally Sound Lawn Care. Additional, information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's web site at http://www.massdfa.org.

3. **Septic Systems**-In a Jan. 5, 1989 letter, the Department approved Waterview Associates septic system design plans. The septic system consists of 31 subsurface sewage disposal systems including 14 leaching trenches located within the IWPA. In order to reduce the potential impacts from the septic systems in the public water supply wellhead protection area, the 8 homes closest to the well (southeast corner) have the sanitary waste pumped to a leaching field located on the western edge of the property. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply.
   Recommendations:
   - Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
   - Educate residents on private septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Residents should dispose of used oil, antifreeze, paints, and other holes hold chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site http://www.state.ma.us/dep/brp/files/yoursyst.htm.
   - Considering previous nitrogen concentrations detected in groundwater and previous microbial problems at the facility, consider having septic system force mainlines checked for leaks by a qualified engineer.

4. **Agricultural** - Approximately, 25 percent of the wellhead protection area is comprised of cranberry bogs which are located southeast of the well. As is the case for most other crops the commercial production of cranberries usually requires input of fertilizer and pesticides. Utilization of best management practices (BMPs) as planned and described in an established conservation farm plan can ensure that agricultural system will uphold the integrity of the surrounding natural resources.
   Recommendation:
   - Encourage Cranberry bog owner/operator to:
     1. Obtain and follow an approved USDA, Natural Resource Conservation Service Conservation Farm Plan.
     2. Maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.
     3. Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Drinking water protection area signs were posted at key locations at the time of the SWAP site visit. Waterview Associates should review and adopt the **key recommendations** above and the following:

Zone I:

- Keep non-water supply activities out of the Zone I.
- Conduct regular inspections of the Zone I. Look for illegal dumping, and evidence of vandalism.
- Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- Educate residents on proper application of pesticides and fertilizers.

Facilities Management:

- Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- Work with local officials in Carver to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Agricultural:

- Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing fertilizer and pesticide use management issues.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Fertilizer Use Fact sheet
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet
- Storm Water Management Handbook, Volume 1 and 2
- A Homeowners Guide to Environmentally Sound Lawn Care